Antispasmodic effect of *Ephedra major* extract on adrenergic and calcium channels receptors in the rat uterus

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Tendency to utilize Ephedra containing products is increasing due to their favorable properties such as energetic, fat burner, decongestant etc. Due to the presence of uterus agonism α and β adrenergic compound and lack of systematic research on this issue, we conducted to determine effects of the hydroethanolic extract of *Ephedra major* (*E. Major*) host on uterus. Isolated uterus from Wistar rat (BW 220±30 g) were tested in the organ bath. Rats were anesthetized and the uterus was isolated and placed in De Jalon solution with bubbled 95 percent O_2 and 5 percent CO_2. Then, it was cut into segment of 1.5-2 cm and mounted in 25 ml chambers of organ bath. *E. Major* extract had a relaxation effect on rat uterus. According to the results, the cumulative concentration of *E. Major* (0.00625 - 3 mg/ml) relaxed the KCl (60Mm) - and oxytocin (0.25 Mm) - induced contraction dose-dependently ($P \leq 0.05$). The inhibitory effect of extract on contraction induced by KCl was unaffected by phenoxybenzamine (0.001 Mm). But verapamil (0.001 Mm) and propranolol (0.001 Mm) inhibited the relaxant effect ($P \leq 0.05$). The inhibitory effect of extract on contraction induced by oxytocin had synergism effect by verapamil ($P \leq 0.05$). These findings revealed that β-adrenergic receptors and presumably other channels such as Ca2+ channels involves in inhibitory effect of *E.* Major extract. The results support the possible beneficiary effects of this plant in traditional medicine.

Key words: *Ephedra major Herb, Uterus, Organ bath, Rat*

Long-term effects of green tea extract on the damage caused by *Doxorubicin* in rat bone marrow

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One of the most well known anti-cancer drug is Doxorubicin. However, green tea has many antioxidant properties. In this study, the long-term effects of green tea on bone marrow lesions caused by Doxorubicin in rats were studied. 30 adult male Wistar rats were randomly divided into 6 groups. Control, LGT (long-term use of 3% green tea extract for 60 days), SHGT (short-term use of 3% green tea extract for 10 days), LGT + DXR (long-term use of 3% green tea extract for 60 days with injections IP doxorubicin for 3 days), SHGT + DXR (short-term use of 3% green tea extract for 10 days in combination with doxorubicin (IP) injection for 3 days), DXR (doxorubicin injection for 3 days). 24 hours after the last injection of DXR, rats euthanized and tissue samples were taken for histopathology of the femur. The enzymes catalase and superoxide dismutase (SOD) were measured. The histopathology results show that the DXR induced severe bone marrow suppression that myeloid cells was more involved. SHGT + DXR group was similar to DXR, but the cell density was similar to control group. The LGT + DXR cell density was very similar to the control group. There was a small amount of myeloid cell destruction. Measurement of catalase and SOD indicates a significant difference between treatment and control groups. Results show that Doxorubicin may cause damage in rat bone marrow, but long-term use of green tea can reduce the damage caused by doxorubicin.

Key words: *Doxorubicin, Green tea, Bone marrow, Rat*

Increasing the shelf life of Iranian caviar by nano silver packaging basis TIO_2 and determination of residue by titration

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Nano-packaging is among the novel packaging technologies used for increasing the quality and safety of food materials. Nano-coating used in Nano-packaging is an enormous revolution in the export of spoilable products.In this research, 38 caviar packs (5 gr) including 4 nano-free coating packs, 4 nano-silver based 6000 ppm coating packs, 4 nano-silver based 5000 ppm coating packs, 4 nano-silver based 4000 ppm coating packs, 4 nano-silver based 2000 ppm coating packs, and 4 nano-silver based 1000 ppm coating packs were dually inspected for bacteria and fungi. After microbial examinations and spread preparation and gram coloring and detecting the gram bacteria in terms of morphology, further inspection for detecting the bacteria and fungi in specific environments was attempted. After a 24-hour inspection, Staphylococcus aureus and Escherichia coli and Aspergillus flavus and Penicillium were detected in nano-free coated samples. However, there has been a considerable decrease in fungi and bacterial growth in 5000 and 6000 ppm coatings. Eventually, the silver quantity in caviar packs were measured by means of titration method and by applying tirazol and concentrated sulphuric acid, and zero silver leftover content was detected. Moreover, 5000 and 6000 ppm coatings with $P<0.05$ considerably decreased fungi and bacterial growth.
As a conclusion, with respect to the achieved results and based on the fact that there is no penetration of nano particles into caviar, the implemented technology can be used to increase the preservation of valuable products and enhance the export industry.

Keywords: *Shelf life, Iranian caviar, Titration*

Compare the effect red and green low level laser light accelerates the healing of the incision in the skin after the suturing in hamsters

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Accelerated wound healing was the first application for this type of laser. In terms of green light laser ability which whether it can enhance wound healing or not there is some disagreement. this study was done in order to compare the green and red light lasers (less powered one) in terms of accelerated wound healing which can be done surgically on the skin. In this study thirty healthy, mature hamster from suyrian strain was selected and randomly divided into three different group as below: A: control group, B: group which was under the radiation of low level red laser, C: group which was under the radiation of low level green laser. After the induction of general anesthesia, the straight incision at the length of two cm was created in the dorsal zone of animal, then by means of nylon 5-0 was sutured in a simple manner. In the group A the cutted site without any intervention was remained intact in order to proceed first type of wound healing, in the group B (by red laser) and C (by means of green laser) the cutted site was treated with the velocity of 0.5 $_{J/cm^2}$ during one minute by constant movement of lasers on the surface of incision which was continued up to six days. Sampling was done in the 3th 7th, and 12th days. The average wound healing in groups B and C were significantly higher than the control group, but between the two green and red laser, there was no meaningful difference. Although the red laser a little bit was good during operation compared with the green one. Less powered laser accelerates the process of wound healing. In those situations which the case is resistance to wound healing we can use less powered lasers.

Key words: *Low level laser, Skin surgery, Healing, Hamster.*

The prevalence of fungal agents in different parts of hatcheries in the Mazandaran Province, Iran

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Today, modern hatchery plays an important role in the development of the poultry industry. However, the arrival of large numbers of eggs to hatchery increase the likelihood of infection with various microorganisms, especially fungal and bacterial contamination. Characterization of microbial contamination and the prevention of this type pollutions can lead to decreasing the incidence of disease in day-old chicks and prevent economic losses. The aim of the current study was to determine fungal contamination in different parts of Mazandaran province hatcheries. The samples were taken from different parts of hatcheries through a passive sedimentation method onto Sabouraud dextrose agar containing chloramphenicol and incubated at 30˚C for 7–10 days. Furthermore, the type and number of fungal colonies were recorded. Fungal isolates belonged to seven genera: Aspergillus (87.8%), Mucor (4.3%), Penicillium (3.5%), Rhizopus (1.6%), Fusarium (1.4%), Alternaria (0.7%) and Cladosporium (0.7%). Aspergillus was the most common genera of isolated fungi and Aspergillus flavus with the 15361 (71.4%) number of colonies was the most common fungal species isolated from the incubation systems. In general, Setter and Hatcher rooms were the most polluted parts of the incubators. According to high pollution of hatchery centers with various fungi, especially Aspergillus species Trying to diagnose, Prevent and eliminate of these contaminations seem necessary.

Key words: *Hatchery, Fungal contamination, Mazandaran*

Role of Adenosine A_{2A} receptors on 6-Hydroxydopmaine-induced catalepsy in rats

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Parkinson's disease (PD) is the second most prevalent neurodegenerative disease in ageing individuals. This movement disorder caused by degeneration of dopaminergic neurons from the substantia nigra pars compacta (SNc). Caffeine consumption has been proposed to be associated with a reduced risk of Parkinson's disease and caffeine in rodent models has protective effects. We have shown that caffeine and SCH58261 as A_{2A} receptor antagonists improve motor dysfunctions induced by 6-hydroxydopamine (animal model of Parkinson's disease) in rats. The present study extends these findings by investigating the role of A_{2A} receptors on motor disorder induced by unilateral infusion of 6-OH-dopamine into the substantia nigra, compact part (SNc) in rat. The experimental study was carried out on 72 male Wistar rats weighing between 180-200 g. Animals were divided into the groups contain 8 rats per group and were kept in standard condition. 6-OHDA-induced catalepsy was assessed by using bar test. Caffeine (30 mg/kg i.p.) attenuated catalepsy on bar test in parkinsonian rats ($P<0.001$), whereas with dose of 10 mg/kg did not produce significant effect ($P>0.05$). SCH58261 (2 mg/kg i.p) significantly improved catalepsy in bar test ($P<0.001$) in parkinsonian rat. These findings suggest that A_{2A} receptors are involved in 6-OHDA-induced motor deficit like catalepsy. It seems that attenuating of catalepsy may caused by inhibition of A_{2A} receptors.

Key words: *Caffeine, Catalepsy, 6-OHDA, Adenosine Receptor, Rat*

Effect of acute and chronic toxicity of Cu nanoparticles on survival and histopathology of hepatopancreas and gills in Pacific white shrimp (*Litopenaeus vannamei*)

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Identification of toxicity effects of nanomaterials in the field of aquatic nanotoxicology is of great significance. This study was conducted to evaluate the effect of acute and chronic toxicity of copper nanoparticles (CuNPs) on survival rate and histopathology of hepatopancreas and gills in PL5 of Pacific white shrimp (*Litopenaeus vannamei*). Acute toxicology test was done according to OECD no. 203 during 96 h and mortalities were recorded every 24 h after exposure of shrimps to concentrations of 0.1, 0.32, 1, 3.2, 10, 32 and 100 mg/lit of CuNPs with average size of 40 nm. Data of mortalities were analyzed by probit software. Median lethal concentration (LC_{50}) was not determined because there was no special order in acute toxicity data. In fact, non dose-dependent mortalities of this species exposed to CuNPs inhibited the calculation of LC_{50}. In chronic toxicity test, shrimps were exposed to concentrations of 0.1, 0.5 and 1 mg/lit of CuNPs for 21 days. Gill histology revealed many damages such as severe necrosis, shortening of the length of the secondary gill lamellae, severe increase of hemocytes and decrease of pillar cells compared to control. Histopathological effects in hepatopancreas of CuNPs exposed shrimps were enlargement of the cell nucleus, necrosis of some cells, as well as reduction of the number of functional cells and destruction of the tubules wall in compare to the control. In conclusion, exposure to CuNPs causes histopathological effects on hepatopancreas and gills of Pacific white shrimp which could finally result in the shrimp mortalities.

Keywords: *Nanotoxicology, Cu nanoparticles, Histopathology, Pacific white shrimp*

Comparison of PCR and conventional culture for the detection of Salmonella in raw milk

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Salmonella is one of the authentic bacteria which cause illnesses, may exist in raw material and food. The existence of these bacteria in food not only causes illnesses, but it also causes the downfall of production quality and reduction of economic growth of the area and country. In this study, 150 bulk raw milk samples were examined to comparison of PCR and conventional culture for the identification of Salmonella in raw milk. Firstly raw milk was cultured and examined through the conventional method; afterwards its supplementary procedures for isolating Salmonella were carried out. Regarding to the results of the culture method, six suspicious isolates were selected to carry out by PCR using *invA* gene. The results showed that none of the isolates were salmonella. Secondly DNA extracted from raw milk and samples were assessed utilizing the *invA* gene by PCR method. Regarding to the results 3 out of 150 examined samples were positive. Totally 2 percent of all samples were contaminated with Salmonella.
The results of this study revealed that PCR is more potent than conventional culture methods to identification of salmonella in raw milk.

Key words: *Salmonella, Raw milk, Conventional Culture, PCR.*